

The effect of telephone follow-up calls on sensitive survey non-respondents

BU-1082-M/HSS-90-CC3

November 1990

**Steven J. Schwager
Catherine M. Crawford
Carlos Castillo-Chavez
Martin Wells
David Gibbs
Carl Howard
Kevin Kordziel
Brian Mellone
Amy Okurowski
Amy Porter
Jong Reem
Thomas Spargo**

Cornell University

FUNDING: This study was supported, in part, by the following grants: College of Human Ecology Grant to Catherine M. Crawford; grants from the Cornell University Office of the Provost, University Office for Campus Affairs, and from the Deans' Office of the College of Agriculture and Life Sciences to Catherine M. Crawford, Carlos Castillo-Chavez, and Steven J. Schwager. This research was also partially supported by Hatch project grant NYC 151-409, USDA, and NIAID grant R01 A129178-01 to Carlos Castillo-Chavez; Hatch project grant NYC 325-413, USDA, to Catherine M. Crawford; and Hatch project grant NYC 151-407, USDA, to Steven J. Schwager.

THE EFFECT OF TELEPHONE FOLLOW-UP CALLS ON SENSITIVE SURVEY NON-RESPONDENTS

Abstract

Telephone follow-up calls were examined as a means of increasing the response rate of subjects who failed to participate in the first week of a sensitive survey. Initial contacts had been made through two letters mailed to a random sample of 2,000 Cornell University undergraduates. The first letter was an announcement explaining the general purpose of the study; the second contained detailed instructions for taking part in the survey and a request for participation. At the end of the first week of the survey, a randomly selected group of non-respondents was contacted by telephone to reinforce the request. This study reports the impact of the telephone contacts in increasing the survey response rate.

Much has been written on the relative merits of personal interview, telephone interview, and mail surveys as methods of data collection (e.g., Colombotos, 1969; Fowler, 1988; Groves and Kahn, 1979; Hochstim, 1967; Klecka and Tuchfarber, 1978; Mangione et al., 1982; Sudman and Bradburn, 1982). Examining two separate studies by the California State Department of Public Health, one of which dealt with the Papanicolaou cancer detection test, Hochstim concluded that the final response rates and substantive findings of three separate strategies, one mainly personal, one mainly telephone, and one mainly mail,

were highly comparable. The only important difference among the strategies involved the cost per interview. Henson et al., (1977) found consistent results between telephone and personal interviews on the reporting of psychiatric symptomatology. However, in a study of past drinking problems, Mangione et al., (1982) found that people admitted having had these problems at a much lower rate in telephone interviews than in either personal interviews or self-administered procedures. Surprisingly, little research has been done on the effectiveness of using telephone follow-up to encourage subjects to participate in a study at a later time. Eckland (1965) found a high response rate to telephone follow-up calls among individuals who had failed to respond to an earlier questionnaire and two follow-up letters. This was the only study of telephone follow-up cited by Linsky (1975) and by Fox et al. (1988) in reviews of work on stimulating responses to mailed questionnaires.

The Cornell Undergraduate Social and Sexual Patterns (CUSSP) survey (see Crawford et al., 1990a, 1990b) provided an excellent opportunity to examine telephone calls as a method of encouragement to respond. The large number of randomly selected students provided an accessible dataset of non-respondents. By telephoning a randomly selected group of these non-respondents after the first week of the survey, a comparison was possible between the second-week response rates of those contacted by phone and those in the control group. The objective of this study was to determine whether telephone callbacks significantly increased or decreased survey response rates. Based on the relatively high response rates in telephone surveys and the effectiveness of follow-up surveys (see Fowler, 1988; Fox et al., 1988 and work cited there; Hochstim, 1967; Linsky, 1975 and work cited there; Mangione et al., 1982), it was hypothesized that telephone reminders might similarly increase the response rate of the CUSSP survey. However, the sensitive nature of this survey left open the possibility that telephone reminders would actually decrease the response rate.

Overview Of The CUSSP Survey

With the rise of the HIV/AIDS epidemic, it has become increasingly clear that there is a need to know much more about people's social and sexual practices (e.g., Sattenspiel, 1989; Waldstatter, 1989; Castillo-Chavez and Blythe, 1989; Busenberg and Castillo-Chavez, 1989; Crawford, 1991; Jacquez et al., 1989; Koopman et al., 1989).

In response to the lack of sufficient data in these areas, three of the authors (Castillo-Chavez, Crawford, and Schwager) developed and administered the Cornell Undergraduate Social and Sexual Practices survey, or CUSSP. This survey elicited information about Cornell University undergraduates' levels of activity (and inactivity) in various social and sexual practices. One goal was to obtain information about the mixing structure of the undergraduate population, that is, who mixes with whom, and where and how often.

A second goal was to examine how accurately sexual behavior among college students can be measured. Accurate measurement is a difficult but important objective because, as mathematical models have shown, a very small fraction of highly sexually active individuals (the "core group") is capable of driving an epidemic such as HIV/AIDS of Hethcote and Yorke, (1984).

The need for data of this kind in forecasting the spread of HIV/AIDS has been fully documented. Such data will also be vital in health planning and in developing public policy to combat AIDS (see Crawford, 1989). Surveys like CUSSP can be executed at other colleges to gain further information about students' activities and attitudes since the onset of the AIDS epidemic.

A third goal was to investigate the comparative effects of asking sensitive questions. For this purpose, two different survey instruments were designed, a direct and an indirect questionnaire. They looked the same on the outside, so the student respondents did not

know that there were two different questionnaires. The direct questionnaire asked explicit questions about sexual practices; the indirect questionnaire asked about time spent with a sexually attractive partner but not about specific sexual practices. Both instruments asked students to rate the extent of their involvement in social activities ranging from academics and classwork to parties, bars, and travel. Both asked about the student's level of alcohol use and where it took place, and also about drug use.

Working from the current master list of undergraduates at Cornell University, the Registrar's Office randomly chose a sample of 2,000 undergraduates. Each of these students was sent a hand-signed announcement letter explaining that the student had been randomly chosen to take part in the CUSSP survey. This letter was followed by another, also hand-signed, that contained instructions and an admission card. After the first week of the survey, those people who had not participated were sent a third letter (and another admission card) to urge them to participate in the second week of the survey. A random set of students from this group were contacted by telephone in the belief that this extra contact might remind them about the survey and encourage them to participate.

All letters and telephone calls explained the nature of the survey and the students' importance in this study. Students were informed that the survey would be anonymous, not just confidential. Anonymity was based on a key aspect of the survey design: no respondent could be linked with a completed questionnaire, in spite of the numbered admission cards that made it possible to track which members of the sample had participated. Students taking the survey dropped the admission cards that they had received by mail into a marked box. Each student then selected a questionnaire, choosing any desired booklet from a large pile in which the two different types of questionnaire were mixed together, making the selection random. Completed questionnaires were placed by the respondents anywhere in a drop-off pile: top, middle, or bottom. These procedures ensured total anonymity for the participants. This was important, since the personal nature

of the survey might otherwise deter people from taking it. As an extra inducement to participate, students were offered a reward, consisting of a choice between a chance at a lottery and a small monetary gift (see Schwager et al., 1990).

Methodology

The sampling frame used for the CUSSP survey was the Registrar's Office list of Cornell's 11,750 undergraduate students, and the Cornell undergraduate population was divided into 16 strata by using three characteristics: gender, class year, and on-campus/off-campus residence. The sampling procedure was stratified random sampling with proportional allocation, that is, with the same sampling fraction for all strata. The sample size for the CUSSP survey was originally set at 2,000 students; however, the sample size had to be reduced to 1,878 because incorrect addresses prevented 122 students from receiving CUSSP information and instructions.

The CUSSP survey lasted for two weeks, followed by a two-week hiatus and then a final three-day survey period. After removal of those students who participated during the first week and those whose addresses were known by the end of the first week to be incorrect, 1,299 students remained. The sampling frame for the telephone follow-up call experiment was this list of 1,299 students. Prepared by the Survey Research Facility of CISER (the Cornell Institute for Social and Economic Research) at the end of week one of CUSSP, it gave the identification number, name, address, and telephone number of each student.

Some students on this list would subsequently be deleted because of incorrect addresses (and telephone numbers); however, these deletions could not be finished until later because survey invitations with incorrect addresses were still being returned by the post office. These deletions further reduced the population for the telephone study to 1,228 Cornell University undergraduates from the Registrar's Office list.

Follow-up calls were made by two kinds of callers, student volunteers and the faculty directors of CUSSP. Calls were made on the Saturday and Sunday between weeks one and two of CUSSP. The six student volunteers were assigned to call a total of 324 students from the sampling frame, 54 per volunteer. This was one-quarter of the 1,299 names in the sampling frame. The 324 names were selected by systematic sampling with a random start, taking every fourth student on the list. The random start resulted in entering the list at entry 4. Thus, the names selected for volunteer calls were the 4th, 8th, 12th, ..., and 1,296th entries in the sampling frame.

To avoid the possibility of interaction between individual volunteer callers and alphabetic sections of the student list, the six volunteer lists of 54 names each were constructed by adding a group of five consecutive chosen names to one list, then adding the next five chosen names to the next volunteer list, and so on. The CUSSP faculty directors made telephone calls to randomly chosen students on their lists, omitting all those called by volunteers.

A telephone script for the follow-up calls was developed to ensure that all calls would have a high degree of uniformity. The script began with a request to speak to the student whose name was on the Registrar's list. After confirming that this was a convenient time for a two-minute conversation, the caller stated that we hoped the student would participate in the CUSSP survey during week two and asked whether the new admission card for week two had arrived. The caller closed by asking whether the student had any questions, reiterating our need to have everyone respond, and reminding the student of the potential \$25 to \$100 cash prize in the lottery following the 15-minute survey. Answers to several anticipated questions from students were also formulated, again to provide as much uniformity among calling personnel as possible. These included: Who is being studied? How did you get my name/telephone number? How can I be sure that this is authentic? Is this confidential? Why don't you call someone else instead of me?

Statistical Analysis and Results

During the first week of the CUSSP survey, 650 students filled out questionnaires. After removing these and the 122 students who, because of incorrect addresses, never received the letters requesting their participation, 1,228 candidates remained from the original 2,000 people randomly selected for the survey.

Of the 1,228 left in the CUSSP non-respondent group, 453 were randomly chosen to be called (324 by student volunteers and 129 by the faculty survey directors). From these, 205 were actually contacted, either directly or through an answering machine. This was a 45.2% contact rate.

During the second week of CUSSP, 55 people out of the 205 who had been contacted actually came to the survey. These were categorized by whether the telephone call was made by a student volunteer or a faculty survey director. Of the 1,023 who had not been contacted, 167 took the survey during the second week. These results are shown in Table 1. The response rates were 41.0% among students called by faculty, 23.5% among those called by student volunteers, and 16.3% among those not called. Note that the second-week response rate of 41.0% among first-week non-respondents called by faculty was higher than the survey's first-week response rate of 34.6% (650 out of 1,878).

TABLE 1. Survey response outcomes of students vs. telephone follow-up status

Week 2 Outcome	Called by Faculty	Called by Student	Not Called	
Responded	16 (41.0%)	39 (23.5%)	164 (16.3%)	219
Did not respond	23 (59.0%)	127 (76.5%)	859 (83.7%)	1,009
	39	166	1,023	1,228

The statistical significance of these results can be examined by a chi-square test. The hypotheses are

H_0 : the type of contact (faculty director call, student volunteer call, or no call) and the response outcome (yes, no) are independent.

H_1 : there is dependence, or association, between the type of contact and the response outcome.

The observed chi-square statistic is $X^2 = 20.21$ (2 degrees of freedom, $p < 0.0001$), so the results are statistically significant and H_0 is rejected. We conclude that there is a significant relationship between the type of contact and whether or not the candidate participated in the survey during week two.

Of the 1,878 students remaining in the sample after the 122 students with incorrect addresses were removed, 995 students participated in CUSSP (650 in the first week, 219 in the second week, and 126 in a final three-day period two weeks later), giving a response rate of 53.0%. After the second week, each student who had not participated was sent a fourth letter containing a last request to take part in CUSSP during this final three-day period. However, no student learned about this final period until more than a week after the end of the second week of the survey. The students who received telephone follow-up calls thus saw only two choices, participating in CUSSP during week two or failing to participate. Consequently, the analysis of the effect of telephone follow-up calls in this paper was based only on week two response, and not on response during the subsequent final three-day period.

Discussion and Conclusion

The results of this study support the view that telephone follow-up calls can raise survey response rates even when dealing with sensitive topics. The calls here were made

under difficult circumstances, for several reasons. First, the survey asked questions of a highly personal nature, raising concerns of confidentiality that could be intensified by telephone contact. Second, many of those students most inclined to participate in CUSSP had already done so in week one, making the students who were called between weeks one and two a possibly less willing group. Third, telephone follow-up calls had to be made between Saturday morning and Sunday evening on a single weekend, by a limited number of personnel, so it was possible to contact only 205 out of the 453 subjects attempted, even with three callbacks to most of those subjects. Finally, because of the time constraints in administering a large, complex survey, the script used in the calls had to be developed in a single day, with no opportunity for training, pilot testing, focus groups, or other feedback.

Even in such adverse conditions, telephone follow-up calls were effective in raising the response rate. They could be made even more effective in future studies of this nature. The script could be refined. Calling procedures could be automated to improve efficiency. Calling schedules could be revised to give a higher contact rate, both in subjects contacted per hour and in total subjects contacted. Previous work on optimal times to contact households (Weeks et al., 1980) is not directly applicable because of schedule differences between households and individual college students.

The difference in response rates between faculty and student volunteer calls suggests that having the caller identify himself/herself as a "student volunteer" was less successful than identification as a "faculty director" of the study. A more authoritative term than "student volunteer," such as "research associate," might produce better response. Roehrer (1963) reported a study in which adding the (fictitious) title "Director of Rehabilitation" below the signature on the cover letter accompanying a mailed questionnaire increased the response rate from 55 percent to 81 percent. In the present study, the title of "faculty director" of CUSSP was probably perceived by many students who were called as representing power and authority. Some work may be needed to come up with a title that will be perceived similarly by a general population.

Several limitations of this study should be noted. Cost comparisons with other contact methods were not made. Such costing information is available in other studies (see Sudman, 1967). Telephone follow-up calls were made by nine different people, introducing an inevitable degree of variability. Although each caller used the same script, differences in gender, tone, and delivery create a degree of nonsampling error.

This study of the effect of telephone follow-up calls provides an encouraging basis for future research on this topic. It demonstrates that follow-up telephone calls can be a valuable tool in mitigating the problem posed by survey non-respondents, particularly when sensitive questions are involved.

References

Busenberg, S. and C. Castillo-Chavez (1989)

"Interaction, pair formation and force of infection terms in sexually transmitted diseases." Pg. 289-300 in C. Castillo-Chavez (ed.), *Mathematical and Statistical Approaches to AIDS Epidemiology. Lecture notes in Biomathematics, Volume 83*, Springer-Verlag.

Castillo-Chavez, C. and S.P. Blythe (1989)

"Mixing framework for social/sexual behavior." In *Mathematical and Statistical Approaches to AIDS Epidemiology*, C. Castillo-Chavez, (Ed.), *Lecture notes in Biomathematics, 83:275-288* Springer-Verlag.

Colombotos, J. (1969)

"Personal versus telephone interviews: Effect on responses." *Public Health Reports*, 84:773-782.

Crawford, C.M. (1989)

"Bridging the gap between knowledge and policy regarding social patterns and AIDS." *Social Sciences Perspectives Journal* 4(3):213-222.

———(1991)

"A perspective on policy concerns related to sexual activity and predicting future incidence of AIDS." *International Journal of Public Administration*. [In press.]

Crawford, C.M., S.J. Schwager, and C. Castillo-Chavez (1990a.)

"Research design for the Cornell undergraduate social and sexual patterns survey." Technical Report HSS-90-CC1/BU-1083-M, Human Service Studies, Cornell University, Ithaca, New York.

———1990b.

"A survey methodology for asking sensitive questions among college undergraduates." Technical Report HSS-90-CC2/BU-1105-M, Human Service Studies, Cornell University, Ithaca, New York.

Eckland, B.K. (1965)

"Effects of prodding to increase mail-back returns." *Journal of Applied Psychology*, 49:165-169.

Fowler, F.J., Jr. (1988)

"Survey Research Methods." Revised Edition. Sage Publications, Inc. Beverly Hills, CA.

Fox, R.J., M.R. Crask, and J. Kim (1988)

"Mail survey response rate: A meta-analysis of selected techniques for inducing response." *Public Opinion Quarterly* 52:467-491.

Groves, R.M. and R.L. Kahn (1979)

"Surveys by telephone: A national comparison with personal interview." Academic Press, New York.

Henson, R., A. Roth, and C. Cannell (1977)

"Personal versus telephone interviews: the effects of telephone interviews on reporting psychiatric symptomatology." Pg. 205-219 in C.F. Cannell et al., *Experiments in interviewing techniques: Field experiments in health reporting, 1971-1977*. NCHSR, Hyattsville.

Hethcote, H.W. and J.A. Yorke (1984)

"Gonorrhea transmission dynamics and control." *Lecture notes in Biomathematics* 56, Springer-Verlag.

Hochstim, J.R. (1967)

"A critical comparison of three strategies of collecting data from households." *Journal of the American Statistical Association* 62:976-989.

Jacquez, J.A., C.P. Simon, and J. Koopman (1989)

"Structured mixing: Heterogeneous mixing by the definition of activity groups." Pg. 301-315 in C. Castillo-Chavez (ed.), *Mathematical and Statistical Approaches to AIDS Epidemiology*. Lecture notes in Biomathematics, Volume 83, Springer-Verlag.

Klecka, W.R. and A.J. Tuchfarber (1978)

"Random digit dialing: A comparison of personal surveys." *Public Opinion Quarterly* 42:105-114.

Koopman, J.S., C.P. Simon, J.A. Jacquez, and T.S. Park (1989)

"Selective contact within structured mixing with an application to HIV transmission risk from oral and anal sex." Pg. 316-349 in C. Castillo-Chavez (ed.), *Mathematical and Statistical Approaches to AIDS Epidemiology*. Lecture notes in Biomathematics, Volume 83, Springer-Verlag.

- Linsky, A. (1975)
 "Stimulating response to mailed questionnaires: A review." *Public Opinion Quarterly* 39:82-101.
- Mangione, T.W., R. Hingson, and J. Barrett (1982)
 "Collecting sensitive data: A comparison of three survey strategies." *Sociological Methods and Research* 10(3):337-346.
- Roeher, G.A. (1963)
 "Effectiveness techniques in increasing response to mailed questionnaires." *Public Opinion Quarterly* 27:299-302.
- Sudman, S. (1967)
 "Reducing the cost of surveys." Aldine, Chicago.
- Sattenspiel, L. (1989)
 "The structure and context of social interactions and the spread of HIV." Pg. 242-259 in C. Castillo-Chavez (ed.), *Mathematical and Statistical Approaches to AIDS Epidemiology*. Lecture notes in Biomathematics, Volume 83, Springer-Verlag.
- Schwager, S.J., C.M. Crawford, C. Castillo-Chavez (1990)
 "Choice of incentive by respondents in a study of undergraduate social and sexual behavior." Technical Report BU-1084-M/HSS-90-CC4, Biometrics Unit, Cornell University, Ithaca, N.Y.
- Sudman, S. and N.M. Bradburn (1982)
 "Asking questions." Jossey-Bass, San Francisco.
- Waldstatter, R. (1989)
 "Pair formation in sexually-transmitted diseases." Pg. 260-274 in C. Castillo-Chavez (ed.), *Mathematical and Statistical Approaches to AIDS Epidemiology*. Lecture notes in Biomathematics, Volume 83, Springer-Verlag.
- Weeks, M.F., B.L. Jones, R.E. Folsom, and C.H. Benrud (1980)
 "Optimal times to contact sample households." *Public Opinion Quarterly* 44:101-114.